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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Moon-Ju Park

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EXAMINER

TANG, KENNETH

ART UNIT

PAPER NUMBER

2195

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/668,320	Applicant(s) PARK, MOON-JU	
	Examiner KENNETH TANG	Art Unit 2195	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/5/07, 5/18/05, 9/24/03</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-17 are presented for examination.

Claim Objections

2. Claim 1 is objected to because of the following informalities: The acronym for "EDF" needs to be spelled out to be "earliest deadline first". Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 1-17 are directed to non-statutory subject matter. Although claim 1 is directed to a method which falls under the statutory category of a "process", for purposes of 35 USC 101, a "process" has been given a specialized, limited meaning in that they must (1) be tied to another statutory class (such as a particular apparatus) or (2) transform underlying subject matter (such as an article or materials) to a different state or thing. Since neither of these requirements are met by the claim, the method is not a patent eligible process under 35 USC 101 and therefore, it is rejected as being directed to non-statutory subject matter.

An example of a method claim that would not qualify as a statutory process would be a claim that recited purely mental steps. Thus, to qualify as a 35 USC 101 statutory process, the claim should positively recite the other statutory class (the thing or product) to which it is tied, for example, by identifying the apparatus that accomplishes the method steps, or positively recite

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the subject matter that is being transformed, for example, by identifying the material that is being changed to a different state.

4. Claims 2-17 are also rejected as being dependent upon rejected claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1-3 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meschi et al. (hereinafter Meschi) (“Earliest Deadline Message Scheduling with Limited Priority Inversion”, IEEE, 1996) in view of Balasubramanian (US 6,687,257 B1).**

6. As to claim 1, Meschi et al. teaches an EDF scheduling method comprising:

checking the number of tasks to be scheduled (counting from 1 through the j^{th} task, page 88, 3rd paragraph);

allocating priorities to the tasks (tasks allocated to various priority levels, page 91, Section 3.2); and

processing the tasks in a shortest-deadline-first order on a temporal axis (page 87, 2nd column, lines 9-13, page 90, Section 3.1).

Meschi is silent in updating current time as the lowest priority. However, Balasubramanian teaches that it is well known for data to be contained in a First-In/First-out (FIFO) queue. In a FIFO queue, entries are inserted according to their time of arrival such that an earlier arriving message would have a higher priority of leaving the queue than the currently arrived entry (col. 2, lines 15-17). It would have been obvious to one of ordinary skill in the art to utilize a FIFO queue to the existing system of Meschi. The suggestion/motivation for doing so would have been to provide the predicted result of having a standard data structure to store data in a computer so that it could be used efficiently, such as doing so in the shortest-deadline-first order. Therefore, it would have been obvious to combine Meschi and Balasubramanian to obtain the invention of claim 1.

7. As to claim 2, Meschi teaches wherein it is determined that the number of tasks to be scheduled is less than the number of a priority level (staying within the available amount of bits) (page 89, Section 2.1).

8. As to claim 3, Meschi teaches wherein the number of a priority level is 2^k (page 91, 1st column, lines 1-2).

9. As to claim 13, Meschi is silent in teaching wherein if the number of tasks is more than the number of a priority level, tasks are grouped into several task sets. However, it would have

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been obvious to one of ordinary skill in the art to group tasks into sets when the number of tasks is more than the number of a priority level (2^n bits) because this would provide the predicted result of being able to fit within the 2^n bits allocated. Therefore, it would have been obvious to include the feature of grouping tasks when the number of tasks is more than the number of a priority level.

10. As to claim 14, it is rejected for similar reasons as stated in the rejection of claim 13. In addition, it would have been obvious to one of ordinary skill in the art to have a current time indicator that is set to each task set. The suggestion/motivation for doing so would have been to provide the predicted result of being able to utilize the same priority scheme for the said grouped task sets.

Allowable Subject Matter

11. Claims 4-12, and 15-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, in addition to overcoming the rejections based on 35 USC 101.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- **US 20030061260 A1** discloses a resource reservation and priority management system (see Abstract).
- **US 6,105,048** discloses an earliest-deadline-first scheduling system (see Abstract).
- **US 6,687,257 B1** discloses a distributed real-time operating system providing dynamic guaranteed mixed priority scheduling for communications and processing (see Abstract).
- **US 7,383,548 B2** discloses a CPU usage regulation system using the earliest-deadline-first algorithm (see Abstract, etc.).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KENNETH TANG whose telephone number is (571)272-3772. The examiner can normally be reached on 8:30AM - 6:00PM, Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Meng-Ai An/
Supervisory Patent Examiner, Art Unit 2195

/Kenneth Tang/
Examiner, Art Unit 2195